THE JAPANESE TUNA FISHING INDUSTRY

Translations

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Explanatory Note

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United States Department of the Interior, Oscar L. Chapman, Secretary
Fish and Wildlife Service, Albert M. Day, Director

THE JAPANESE TUNA FISHING INDUSTRY

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THE PRESENT CONDITION OF THE TUNA FISHERIES
Translated from Katuo to Maguro, No. 10, May 1951

Translator's note: This article of which this is a partial translation appeared in the anniversary number of the magazine of the Japan Tuna Boat Owner's Association, and aims to show the degree of recovery which Japan's tuna industry had made in 5 years after the war. The sources of some of the statistics are not stated, but in view of the character of the organization which published them it is felt that they are probably fairly accurate. Amounts appearing in the original article in Japanese units of kan and yen have been converted into pounds and dollars at the rates of 8.27 pounds to the kan and 360 yen to the dollar. Where amounts are stated in tons, it is not clear whether long tons, short tons, or metric tons are meant, but it is assumed that in the case of import and export items, which are chiefly traded with the United States, the tons are of 2,000 pounds. If not, the difference is small because the long ton is 2,240 pounds and the metric ton is 2,205 pounds. Vessel tonnages are given in 100-cubic-foot units of capacity.

1. Fishing vessels

As a result of the war the tuna fleet was at one time largely destroyed, but it has recovered swiftly. At present the number of vessels is not greatly different from the prewar number and the size of the vessels has increased markedly

Fishing vessels (of over 20 tons)

Year	Number of vessels	Total tonnage	Total horsepower	Average tonnage	Average horsepower
1940	708	47,297	84,122	67	133
1947	956	72,864	127,612	76	133
1948	1,140	93,790	170,171	82	149
1949	1,163	96,426	181,707	83	156
1950	1,100	92,158	196,098	84	178

CONTENTS

Page

The present condition of the tuna fisheries (from Katsuo to Maguro, No. 16, May 1951) 1

Papers on the economics of the Japanese tuna long-line fishery.. 15

The calculation of the first cost price in the tuna fishery, by Takuzo Nakayama (from Suisankai, the Journal of the Fishery Society of Japan, No. 770, May 1948, pp. 10-16)..... 15

Outline of cost price calculation--operating in the red as shown by figures (from Katsuo to Maguro, No. 1, July 1948) 27

Development of the movement to revise ceiling prices (from Katsuo to Maguro, No. 3, November 1948) 28

What is the effect of increased handling charges and material costs? (from Katsuo to Maguro, No. 13, January 1951) 29

Number of vessels by tonnage classes (as of December 1950)

Vessels	Over 20 tons	Over 32 tons	Over 55 tons	Over 75 tons	Over 95 tons	135 to 278 tons	Total
Number	156	192	158	163	216	215	1,100
Tons	4,012.46	8,074.91	10,275.44	13,854.43	22,333.66	33,607.84	92,158.74
Horse-power	11,760	19,423	22,465	30,666	49,737	62,047	196,098

2. Fishermen

Fishermen on the tuna long-line vessels all have tuna fishing as their sole occupation, but of the fishermen on the skipjack and saury vessels over half engage in fishing only seasonally. (Translator's note.--The Japanese draw a sharp distinction between what they call the "tuna" fishery, which employs long lines to catch large tuna of several species, as well as spearfishes and shark, and the "skipjack" fishery in which skipjack, albacore, and occasionally other small tunas are taken on pole-and-line gear using live bait. There is no general term including both of these groups of fish as does our word "tuna".)

Employment of tuna fishermen in 1949

Item	Winter season		Summer season		Remarks
	Full-time	Part-time	Full-time	Part-time	
Number of vessels	806	688	406	754	"Winter" season is October-March. "Summer" April-September. "Part-time" fishermen are those whose main occupation is skipjack pole-and-line fishing, but who turn to tuna long-lining or saury lift-netting in winter.
Number of fishermen	8,216	19,502	8,216	31,938	
Totals	1,094 vessels 27,718 men		1,160 vessels 40,154 men		

3. Catch

Since the war the skipjack pole-and-line fishery has been adversely affected by cold water resulting from abnormal currents, the fishing season has been about 2 months late, and the fishery has not yet recovered, the catch being only about 33 percent of prewar. The catch in the tuna long-line fishery has grown steadily from year to year and catch efficiency is now close to what it was before the war.

(a) Species.--The fish being taken at present are as follows: skipjack, black tuna or bluefin tuna, yellowfin tuna, albacore, big-eyed tuna, broadbill swordfish, striped marlin, black marlin, white marlin, sailfish, and shark.

(b) Catch by years

Year	Skipjack fishery			Tuna longline fishery			Total Number of vessels	Total amount of catch
	Catch	Number of vessels	Catch per vessel ton	Catch	Number of vessels	Catch per vessel ton		
	Pounds		Pounds	Pounds		Pounds		Pounds
1940	203,670,575	360	6,807	81,269,133	475	2,795	708	284,939,707
1946	64,739,851	180	5,285	13,932,213	149	1,257	unknown	78,672,063
1947	146,362,245	560	3,003	63,159,876	421	1,886	956	209,522,121
1948	137,050,920	609	2,465	109,233,220	644	1,894	1,140	246,284,140
1949	129,358,717	606	2,283	140,941,334	628	2,274	1,163	270,897,562
1950	165,658,851*	---	---	173,504,600*	---	---	1,100	339,163,451*

*Estimates published in Katsuo to Maguro. No. 19, August 1951.

Catch by months of the pole-and-line fishery
/averages, in pounds, for 3 years, 1947-49/

Month	Skipjack	Black tuna	Yellowfin	Albacore	Big-eyed	Others	Total
January	7,261	---	---	---	---	6,442	13,703
February	64,547	9,535	1,075	---	---	6,186	81,344
March	666,264	76,539	38,216	23,867	25,066	36,100	875,222
April	3,528,793	295,049	376,120	517,702	218,187	423,399	5,359,250
May	13,190,170	386,292	562,972	391,237	203,682	330,593	15,064,946
June	20,381,448	291,311	341,609	6,935,644	424,781	368,453	28,743,245
July	36,765,650	385,448	358,720	2,537,865	1,076,622	344,710	41,469,014
August	22,402,363	159,255	199,911	152,367	182,982	283,818	23,380,696
September	16,354,421	180,815	132,113	8,121	66,135	235,199	16,976,805
October	4,162,150	122,487	100,853	8,336	27,589	119,253	4,540,668
November	681,986	43,674	6,070	4,234	1,340	295,256	1,032,559
December	84,313	22,313	794	3,308	1,340	141,111	253,178
Total	118,289,366	1,972,718	2,118,452	10,590,951	2,227,723	2,591,421	137,790,630

nths of the tuna longline fishery
in pounds, for 3 years, 1947-49/

adbill	Striped marlin	Black marlin	White marlin	Sail-fish	Shark	Skip-jack	Others	Total
44,847	340,501	185,976	6,533	33,667	3,416,081	75,886	541,751	9,836,429
80,656	334,406	187,282	3,209	16,317	2,788,884	49,355	633,738	9,231,487
03,351	337,457	284,711	1,563	20,584	3,311,283	84,213	561,34	9,828,209
91,402	319,768	375,615	8,295	33,179	3,133,056	54,218	614,891	6,930,492
46,693	320,785	1,091,193	22,635	129,235	4,451,509	81,451	736,278	8,891,904
[illegible]	444,785	1,537,095	47,478	123,099	5,775,685	80,244	559,987	11,076,82[illegible]
[illegible]	319,280	1,089,010	28,226	55,277	4,036,537	70,890	374,102	8,518,538
[illegible],615	232,858	1,099,629	14,253	68,352	5,307,579	52,771	202,359	9,047,512
320,438	372,051	462,905	108,329	20,741	3,36[illegible],747	4,515	195,999	[illegible],644,507
968,599	495,795	361,349	73,027	37,265	2,10[illegible],941	10,983	648,161	5,730,109
[illegible],313	592,339	346,852	86,124	26,572	[illegible],833	48,644	[illegible]	8,40[illegible]
936,387	601,097	251,375	51,911	23,313	3,9[illegible],141	32,460	523,636	11,301,666
309,704	4,711,121	7,272,994	456,587	587,600	44,971,259	595,630	6,097,27[illegible]	104,443,980

4. Imports and exports

In the past the main export items have been albacore, broadbill swordfish, and skipjack, both frozen and canned. Last year yellowfin tuna taken by mothership-type expeditions was exported for the first time. With the beginning of exploitation of the southern sea area, this species holds great promise for the future.

Yearly exports

Year	Frozen fish		Canned fish		Calculated original weight	
	Amount	Index	Amount	Index	Amount	Index
	Tons		Cases		Pounds	
Av. 1935 to 1939	3,860.5	100	435,168	100	32,915,369	100
1947	312.0	8	---	---	624,203	2
1948	2,349.7	61	72,560	17	10,465,222	32
1949	2,957.4	77	211,526	49	19,510,667	59
1950	13,663.0	354	1,454,820	219	113,132,773	344

When the value of the exports and the value of imports of oil and cotton thread used by skipjack and tuna boats and the cottonseed oil used in canning are compared on the basis of 1950 figures, the value of exports exceeds that of imports by $13,000,000. This balance is shown as follows:

Exports (dollar receipts) $19,957,191 (7,184,588,760 yen)
Imports (dollar payments) $ 6,849,060 (2,465,661,600 yen)
Excess of dollar receipts $13,108,131 (4,718,927,160 yen)

Imports and Exports Related to the Skipjack and Tuna Fisheries

Exports (1950)

Item	Quantity	Unit price (f.o.b.)	Amount	Remarks
Frozen albacore	7,442 tons	$320.00 per ton	$ 2,381,440	Current price
Broadbill	6,526,430 lbs.	.23 per lb.	1,501,079	Unit price as of 12/50
Frozen skipjack	1,717 tons	218.00 per ton	374,306	Unit price as of 11/50
Frozen yellowfin	1,240 tons	235.00 per ton	291,400	Current price
subtotal for frozen fish	13,662 tons	---	$ 4,548,225	---
Tuna canned in oil	608,879 cases	10.50 per case	6,393,230	Unit price as of 12/50
Skipjack canned in oil	832,364 cases	7.50 per case	6,242,730	Unit price as of 12/50
Other canned tuna	13,577 cases	7.50 per case	100,470	Current price
subtotal for canned fish	1,454,820 cases	---	$12,736,430	---
Frozen shark livers	340,000 lbs.	.30 per lb.	102,000	Average for 1950
Liver oil (tuna, skipjack, shark)	5,576 drums	461.00 per drum	2,570,536	Average for 1950
Total			$19,957,191	

Imports

Item	Quantity	Unit price (C.I.F.)	Amount	Remarks
Fuel oil	126,000 kiloliters	$ 22.64 per kiloliter	$2,852,640	Current price
Cotton, raw	3,197,987 lbs.	.50 per lb.	1,598,994	Current price
Manila hemp (raw fiber)	493,684 lbs.	.36 per lb.	177,726	Current price
Canning oil	3,171 tons	700.00 per ton	2,219,700	Current price
Total			$6,849,060	

5. Organization of the industry

The operators (boat owners) in this industry are for the most part individuals, companies and other bodies representing only 20 percent of the whole.

(1) Types of business

Type of operator	Number	Number of boats	Tonnage	Percentage of vessels
Companies	78	202	21,196	18
Cooperatives	5	18	837	2
Individuals	730	880	70,124	80
Totals	813	1,100	92,157	100

Note.-- There is a marked tendency for company operations to decrease in number and for fishing vessels to pass into the hands of individual owners.

Type of owner	Number	July 1949	Percentage of owners	Percentage of vessels	December 1950	Percentage of owners	Percentage of vessels
Companies	Companies	103	13.2		78	9.6	
	Vessels	291		2.49	202		18.4
Cooperatives	Cooperatives	13	1.7		5	0.6	
	Vessels	31		2.6	18		1.6
Individuals	Individuals	661	85.1		730	89.8	
	Vessels	848		72.5	880		80.0
Total	Operators	777	100		813	100	
	Vessels	1,170		100	1,100		100

(2) Distribution of fishing vessels

The vessels are distributed among approximately 80 ports in the 20 prefectures along the Pacific coast from Hokkaido to Nagasaki.

(3) Method of dividing the proceeds

Proceeds from the catch, less trip expenses, are divided between the owner and the crew in the following manner: On tuna long-line vessels the owner usually takes 60 percent and the crew take 40 percent, while on skipjack pole-and-line vessels the owner usually takes 45 percent, leaving 55 percent for the crew.

Note.--Trip expenses include such items as market handling charges, fuel, bait, ice, provisions, small tools, and other expendable items. The boat owner pays for repairs, fishing gear, vessel gear, insurance, and interest. Crew members pay for their clothes, daily necessities, and luxuries. The productive work of the vessel is carried on according to the wishes of the crew members, and the owner and the crew members always feel that they share the same profits or losses. There are almost no instances of conflicts between capital and labor, such as the vessel owner oppressing the crew members or the crew members opposing the vessel owner.

6. Manner of sale

The catch from each cruise is sold at the fish market in one of the major fishing ports throughout the country or at the cooperative sales centers established by the fisheries cooperatives. The price of the fish is established in each case by supply and demand, and is not

directly affected by the cost of production nor by the wishes of the boat owner and the crew.

7. Fishing methods and composition of the catch

(1) Skipjack fishery:

Fishing method -- pole and line
Fishing season -- April to October
(almost all year round in
Kagoshima Prefecture).
Bait -- live sardines.
Fishing ground -- waters of the warm-current system
within 600 miles of the Pacific coast.
Catch -- roughly as follows:

Species	Average catch for 3 years	Percent
	Pounds	
Skipjack	118,285,810	85.8
Albacore	10,593,870	7.8
Big-eyed	2,224,630	1.6
Yellowfin	2,117,120	1.5
Black tuna	1,976,530	1.4
Others	2,588,510	1.9
Total	137,786,470	

(2) Tuna fishery:

Fishing method -- long line.
Length of lines used in one set:
135-ton class -- 45 miles (79,000 meters)
100-ton class -- 36 miles (66,000 meters)
Fishing season -- year round.
Bait -- saury, sardine, squid, mackerel - mostly frozen.
Fishing grounds -- within a maximum radius of 3,500 miles
(including the area of mothership operations).
Catch -- roughly as follows:

Species	Average catch for 3 years*	Percent
	Pounds	
Albacore	14,869,946	14.2
Big-eyed	8,195,570	7.8
Yellowfin	7,988,820	7.7
Broadbill	7,310,680	7.0
Black marlin	7,277,600	7.0
Striped marlin	4,713,900	4.5
Black tuna	1,381,090	1.3
White marlin	454,850	0.4
Sharks	44,972,260	43.1
Others	7,277,600	7.0
Total	101,464,630	

Note.--These figures include the catch of the mackerel-shark long-line fishery.

*(Translator's note.--Probably 1947-49)

(3) Mothership-type tuna fishery:

This fishery began last year, and three expeditions fished during 1950. All fishing was done by long lines. By May 1951 the Tenryu Maru fleet of the Nansei Fishing Company and the No. 3 Tenyo Maru fleet of the Taiyo Fishing Company had begun operations. The Settsu Maru fleet of the Nippon Suisan Company was scheduled to sail around the end of that month. The fishing grounds are in the South Seas, and results achieved last year were as follows:

Item	Taiyo fleet	Hoko fleet	Nansei fleet	Remarks
Mothership	No. 2 Tenyo Maru 10,619 tons	Taiko Maru 2,940 tons	Tenryu Maru 557 tons	3 mother-ships
Fishing vessels	25 boats averaging 141 tons, total 3,515 tons	13 boats averaging 160 tons, total 283 tons	6 boats averaging 157 tons, total 940 tons	44 boats
Operating period	June 8, 1950 to September 14, 1950	July 9, to October 14, 1950	November 25, 1950 to January 22, 1951	---
Days of operations	77	66	---	---
Total catch	8,118,841 lbs.	5,579,951 lbs.	585,318 lbs.	14,284,109 lbs.
Average catch per vessel	324,755 lbs.	429,230 lbs.	97,553 lbs.	

Note: 1. From the catch of the Taiyo fleet, 1,188 tons of round frozen yellowfin and 341 tons of fillet and other products were exported to the U. S.

2. The greater part of the catch of the Hoko fleet was used as raw material for canning.

3. The catch of the Nansei fleet was sold in Japan as fresh fish.

(4) Purse-seine fishery:

Since the war between 10 and 20 vessels have gone into operation with a nucleus of experienced fishermen who have returned from America, however, this type of fishing is not yet out of the experimental stage.

8. Materials

The amounts of the chief materials and their current prices (prices at which the fishermen buy them) are as follows:

(1) Oils -- $4,500,000
Fuel oil -- 126,000 kiloliters, $3,777,778
Lubricating oil -- 5,040 kiloliters, $666,667
Gasoline -- 1,260 kiloliters, $55,556

(2) Cotton thread -- $3,000,000
Cotton thread -- 2,720,000 pounds, $3,000,000

9. Special characteristics of the tuna fisheries

(1) As operations are entirely on a share basis, there is a strong spirit of cooperation between the boat owner and the crew.

(2) The fishing involves extremely hard labor for long hours at sea.

(3) Periods spent at sea away from the base are the longest of any maritime occupation (in the tuna fishery each cruise lasts about 60 days).

(4) As fishing is good just before and just after storms, there are cases in which it is impossible to avoid staying at sea during rough weather, making this the most dangerous of the fisheries.

(5) This is a fishery in which it is necessary on each trip to search for schools of fish which migrate widely in the open sea.

(6) Fishing grounds and bases shift with the seasons.

(7) This is a fishery in which, because of the conditions cited above, the consumption of fuel and fishing gear materials is comparatively great.

(8) The catch in this fishery is mixed, several species of tuna and spearfishes being taken at one time.

(9) There is a strongly rooted custom of handling the tunas principally as high-grade merchandise for the big city trade.

(10) Where the edible portion of fish in general averages about 50 percent, it is almost half again as much in the case of the tunas, and the nutritional value of these fish is the greatest among all marine products.

(11) Because of the large size of the tunas, their form and weight change between the time they are produced and the time they are consumed, and when they are cut up, it is difficult for the consumer to distinguish between them because of the similarity of the quality of their flesh.

Note.--Medium sizes range from 85 to 250 pounds in the case of striped marlin, broadbill, and black tuna; 42 to 165 pounds in the case of yellowfin; 40 to 85 pounds for big-eyed tuna; 25 to 40 pounds for albacore; and 4 to 8 pounds for skipjack.

(12) The peak of the fishing season for skipjack is in the summer, while that for tuna is in the winter. They are both seasons when general fish production throughout the country is at its lowest.

(13) The tunas are the fishes most desired by buyers in America, and on the other hand, the necessary materials for this fishery are imported chiefly from America.

(14) The tuna-fishing grounds of the greater part of the Pacific Ocean and of the northern part of the Indian Ocean were developed by Japanese fishermen, but they are soon to become international fishing grounds.

(15) There is still, throughout the world, a great deal of room for the development of fishing grounds, and there are at present no signs of a decline in the resources.

10. Administrative control

Formerly this was a free fishery, but in September 1946 the Ministry of Agriculture and Forestry promulgated regulations for the control of the tuna fisheries. According to these regulations, anyone taking skipjack, tuna, or sharks by pole-and-line or long-line gear from a vessel of over 20 gross tons must have permission from the Minister of Agriculture and Forestry, and this system continues in force at present.

11. Industry groups

There are two organizations which include all of the skipjack and tuna fishermen throughout the whole country. There is an association of the local tuna fishermen's cooperatives in each area and there is an association for fishermen in regions where there are no organized cooperatives or similar groups. (Translator's note.--A list of the member organizations is omitted).

12. Labor organizations

There are five organizations whose membership is composed exclusively of skipjack and tuna fishermen, and their combined membership is about 8,000 men. (Translator's note.--The names and addresses of these 5 labor groups have been omitted from the translation).

13. Welfare establishments

Three rest homes for tuna fishermen are located at the ports of Misaki, Yaizu, and Morotozaki. (Translator's note.--A list of the membership of the Japan Tuna Fishermen's Association by prefectures and a list of the officers of the organization have been omitted from the translation).

* * *

PAPERS ON THE ECONOMICS OF THE JAPANESE TUNA LONGLINE FISHERY

Translator's note.--The following material consists of translations and abstracts of articles appearing in Japanese trade journals from May 1948 to January 1951. These articles were written by officers of the Japan Tuna Boat Owners' Association and are intended to show that under the price-control system in force in Japan from March 1946 to April 1950 the tuna fishermen were unable to make any money because ceiling prices on fish were set too low and material costs were too high. The opinions and figures presented cannot be considered unbiased, but it is thought that they may be of interest as affording an insight into the general order of magnitude of certain categories of costs in the Japanese tuna-fishing industry. An effort has been made to correct certain figures where they were obvious typographical errors or mistakes in calculation, but there remain a number of discrepancies which cannot be explained by the data supplied in the papers. These have been noted where they occur. Figures have been converted from Japanese units at the rates of 8.27 pounds to the kan and $1 to each 360 yen.

THE CALCULATION OF THE FIRST COST PRICE IN THE TUNA FISHERY

By Takuzo Nakayama

Foreword

How should the proper price for fisheries products be determined? This should have been settled before price control was first applied to fisheries products, but the question still has not been answered, although several corrections have been made since the ceiling prices were set, and it is an undeniable fact that this situation is interfering with increased fish production. Of course, the calculation of proper fish prices in a controlled economy and in the face of inflation is very difficult, and although a standard has been established, because it is influenced by the pre-existing price structure, the amendments hitherto have not gone beyond parity with general prices and thus have simply postponed the solution of the problem. What is needed more than anything else in the fishing business today is stability of fish prices, and no matter how troublesome or irrational the price system, it must begin from the calculation of cost prices in actual operations.

Of course, I have my own opinions about controlling the price of fish, the value of which varies depending on its freshness. Furthermore, the cost price of the same species of fish may differ depending on the method by which it was captured (today emphasis should be placed on

quantity production in the fisheries), but even so one cannot go along indefinitely with the argument that the cost price of fish cannot be calculated. No, from this angle the fishing business needs to be made more scientific. Even in the fishing business, if data are assiduously gathered and the figures are calmly calculated, it is probably not impossible at present to calculate the cost price. The following is my attempt to calculate the cost price by figuring income and outgo in the tuna fishery.

Basic Data and Bases for Calculation

I gathered the data shown in table 1 from 14 tuna long-line vessels which came into port at Tokyo, Yokohama, and Misaki during one month beginning December 6, 1947. The total number of tuna boats at present is 760, and it cannot be affirmed without question that a sample of data from 14 boats is adequate, however, these have been considered representative enough to serve as basic data.

The following basis for calculation has been established from the averages of these 14 boats:

Vessel - 135 tons, 250 horsepower, Diesel, standard-type steel boat.
Fishing gear - 350 baskets of long lines.
Crew - 28.3 men.
Time required for 1 cruise - 12 days preparation, 15 days run to and from the fishing ground, 22.5 days fishing; a total of 49.5 days. Prorated annual repairs (once a year for 60 days), 10 days per cruise bringing the total to 59.5 days for each of 6 cruises per year. (In addition, 8 days per year must be allowed for painting the bottom of the boat.)
Amount and value of catch - for one cruise 69,088 lbs., $2,519,
- for 6 cruises 414,526 lbs., $15,114.

Calculations were made on this basis, prices being the ceiling prices (in effect beginning December 26, 1947). Two separate calculations have been made for purposes of comparison, one, designated (A), on the assumption that all materials required could be obtained at ceiling prices, and (B) based on what could actually be obtained at the time.

long-line vessels entering ports of Tokyo, Yokohama,
rom December 6, 1947, to January 6, 1948

	No. 1 A...ma	No. 12 Hoko	No. 5 Hoko	Shonen Aikoku	No. 11 Marutaka	No. 12 Marutaka	Zuiyo	Fukuyo	No. 20 Hokoku	Totals	Average
	Y 200	D 250	D 210	D 225	D 250	D 250	D 250	D 250	D 210	3,365	258
	138	154	99	123	150	150	152	140	95	1,942	138.7
	28	26	35	25	25	27	24	23	39	39	28.3
	337	47	28	34	52	41	42	55	28	540	38.5
54	34,908	23,073	3,283	5,078	69,526	40,118	43,773	53,796	4,788	367,428	26,241
91	41,838	24,397	16,854	6,591	1,017	17,243	4,482	4,077	10,462	217,460	15,531
--	---	---	---	---	595	389	1,067	910	5,954	9,080	645
13	5,318	5,053	447	2,564	---	3,829	---	116	4,036	32,228	2,299
74	141	---	-	---	174	1,191	---	695	---	2,316	165
--	91	124	331	265	935	---	33	174	14,241	15,812	1,125
91	4,681	2,431	885	984	15,746	5,028	802	728	12,835	43,269	3,085
10	14,431	28,317	21,601	22,470	---	18,459	30,740	32,733	1,406	278,815	19,914
---	---	---	---	---	---	---	---	---	---	802	50
01	101,423	86,728	43,426	37,959	88,009	85,967	80,914	93,087	53,722	967,243	69,088

-bulb engine; the unit of fish catch is pounds. Minor discrepancies in the totals
ginal table and are apparently errors in arithmetic.

Table 2.--Value of average catch at ceiling prices

Species	Amount	Value
	Pounds	
Yellowfin tuna) Striped marlin) Bigeyed tuna) White marlin)	26,241	$1,395.87
Albacore) Skipjack)	15,531	748.40
Sailfish	645	24.85
Broadbill swordfish	2,299	99.50
Dolphin	248	3.37
Wahoo) Snake mackerel)	1,125	26.69
Blue shark	3,085	42.71
Other sharks	19,914	177.50
Fins	50	.77
Total	69,088	$2,519.15

Amount and Value of Landings (Income)

Calculating the average catch as shown by table 1 in terms of the ceiling prices, we get table 2.

Lumping these into large categories, the total weight of the tuna and spearfishes was 44,724 lbs. and that of the sharks and other species 24,355 lbs., or in terms of value $2,268.10 or 90% of the whole for the tunas and spearfishes, and $251.05 or 10% of the whole for the sharks and other species. Extending this to cover a whole year we get:

One cruise - 69,088 lbs., $2,519.15
Six cruises - 414,526 lbs., $15,114.89

These figures are based on the sale of two-thirds of the catch in Tokyo, the main centers of Kanagawa, Aichi, Kyoto, Osaka, and Hyogo prefectures and in the inland prefectures, and one-third in the "B" area (Hokkaido excepting the coastal areas). (In table 2 amounts less than 1 kan or 1 yen are omitted).

Trip Expenses (Outgo)

The trip expenses (generally-shared expenses) necessary in order to get the landings listed above are given in table 3.

In table 3, the market charges are 4 percent of the total value of fish landed, and the replacement expenses for fishing gear are 4 percent of what remains after subtracting the landing charges. The parenthetical note "at legal prices" means that these are the expenses in cases where it is possible to procure these items at the fixed ceiling prices; and in the case of the ice, the transportation and crushing expenses are added to the ceiling price.

Table 3.--Account of trip expenses for one year

Market handling charges	$ 604.60	
Replacements for fishing gear	580.41	
Fuel oil	2,511.37	(at legal prices)
Lubrication oil	341.58	" " "
Gasoline	37.35	" " "
Bait	1,429.92	" " "
Ice	501.77	" " "
Rice	298.19	" " "
Other provisions	378.09	
Miscellaneous expenses	715.35	
Total	$7,397.71	

Next, for an explanation of the details of the rice, other provisions, and miscellaneous expenses categories, the legal value of the rice is figured on the basis of 5 go /1.6 pints/ per man per day, which with a crew of 28.3 men amounts to 83.69 to /42 bushels/ for a cruise of 59.5 days or 15,796 lbs. for 6 cruises in the year, which computed at a unit value of 1.81 cents per pound amounts to $298.19. Other provisions are very hard to obtain, anything which can be come by being put aboard. The 14 vessels investigated carried miso, shōyu, salt, sauce, tea, vinegar, curry powder, cooking oil, konnyaku, dried plums, pickles, daikon, cabbage, burdock, spinach, edible seaweeds, sweet potatoes, red peppers, etc., and the average expenditure per vessel per voyage for these miscellaneous provisions was $63.00 which for 1 year would amount to $378.10. The miscellaneous expenses varied in types and amount for each vessel, but in general they were for cotton waste, light bulbs, electrical equipment, swabs, brooms, sleeping mats, straw mats, chalk, putty, medicines, sandpaper, emery powder, wax, wire netting, belt wax, logbooks, dusters, eating utensils, navigational charts, deck brushes, thermometers, scrubbing brushes, small tools for the engine department, paint, marine hardware, instrument repairs, and pre-cruise ceremonies. The average miscellaneous expenses for 1 trip of one vessel were $119.20. For a year this would amount to $715.35.

Bait is a problem. When it can be obtained at the legal prices, frozen saury is 3.6 cents per pound There are 3.5 fish per pound,

making the cost slightly over 1 cent per fish, or $134.70 for 12,966 fish. Frozen squid are 3.14 cents per pound, with 1.73 squid to a pound. This gives the cost per squid of 1.8 cents or $47.95 for 2,627 squid. Frozen sardines are 2.54 cents per pound. There are 8.65 fish to a pound, making one fish worth about 1/3 cent or $55.66 for 18,552 fish. The total of $238.32 represents the bait expense for one trip, so for six trips it would be over $1,429.92. In actuality it is difficult to get bait at the ceiling prices and they are bought at free market prices, which makes the cost 2.1 cents for one saury, 3.9 cents for one squid, and 0.6 cents for one sardine, according to the actual experience of research vessels. On this basis, the cost for one trip would be $488.66, and for 6 trips it would be $2,931.96. This gives us the following:

(A) Trip expenses where materials are bought at ceiling prices--$7,397.71.

(B) Trip expenses when price-controlled items are obtained at actually prevailing prices--$8,900.60.

These figures subtracted from the previously calculated value of landings leave:

In case (A)--$7,716.56
In case (B)--$6,213.80

The division of the remainder is 60 percent to the boat owner and 40 percent to the crew, therefore--

In case (A) -- owner's share, $4,629.93 -- crew's share, $3,086.62
In Case (B) -- owner's share, $3,728.28 -- crew's share, $2,485.52

These figures are further divided below into the boat owner's account and the crew's account:

Table 4.--Amounts paid out by the boat owner

Repairs	$ 1,958.33	
Fishing gear	1,747.47	(at ceiling prices)
Vessel equipment	28.48	" " "
Amortization	2,678.79	
Insurance	505.60	
Interest	2,048.37	
Various taxes	680.61	
Association dues	37.50	
Bonuses to the crew	359.85	
Indirect expenses	998.97	
Total	$10,987.82	

(Translator's note.--The total in the original table is short by 20,000 yen [$55.56].)

Boat Owner's Account (Income and Outgo)

The boat owner's share of the proceeds has now been found. What are the various expenses to which the boat owner must apply it? (Table 4.)

A further explanation of some of these expenses is that the repair expenses represent $25 for deck department repairs and $50 for engine repairs for one trip, these sums being multiplied by six for the year. Repair expenses in connection with the intermediate inspection (both deck and engine) are $711.11 for the year. For the regular inspection (both deck and engine) they amount to $430.56. The expense of painting the bottom of the boat is $86.11, and the cost of hauling out the boat twice a year is $97.22 each time, giving a total of $1,958.33. The association dues are those paid to the local association (19 cents a ton) and those paid to the federation (8 cents a ton). The next problems to be taken up are the expenses for fishing gear, vessel equipment, interest, and taxes. The following table breaks down the fishing-gear expenses:

Table 5.--Itemization of fishing-gear expenses

Item	Amount	Unit cost	Total cost
Cotton line	2.25 kan /18.6 lbs./	$1.02	$ 2.30 (ceiling price)
Wire	27.3 meters	.018	.05 " "
Sekiyama	30 fathoms	.208	.65
Hooks	6	.03	.16
Glass floats	1	.21	.21
Flags	1	.14	.14
Swivels	6	.02	.13
Line baskets	1	.28	.28
Total for 1 basket			3.90
Total for 350 baskets			$1,365.39
Light buoys			41.67
Tanning lines			175.00
Transportation charges			19.45
Charges for making up the gear			144.44

(Translator's note.--An error of 500 yen ($1.80) appears in the original table.)

In case (A), where part of the materials are obtained at ceiling prices, the total cost of fishing gear is $1,747.47.

The above total is figured on the basis that the cotton line and the wire could be obtained at the ceiling prices. However, in actuality the amount obtainable on ration at the ceiling price is only about 40 percent of the amount required, and therefore under existing circumstances the cotton line, with a unit cost of $9.72, would come to $21.88 for 2.25 kan [18.6 pounds], and the wire, at a unit cost of 1.26 cents, would come to a total of 34 cents for 27.3 meters. This would make the actual cost of 350 baskets (B, all materials bought on the free market) $8,288.00, or about five times the previously mentioned total.

Ship's gear is principally manila rope, for which there is in actuality no ration at all, so at (B) prices, about 4.7 times the official ceiling price, this item would come to $133.34.

Under interest is included 8.8 percent on the vessel value of $18,751.50, fishing gear value of $1,747.47, and operating capital of $2,778.00 or a total of $23,276.97. As the actual value of the fishing gear at present prices is $8,617.91, the (B) interest would be $2,652.97.

The item under various taxes and public assessments represents a total of $638.94 in taxes and $41.67 in contributions to public bodies. The vessel earnings tax and crew insurance costs have not been included, and consequently considerably greater expenditure by the boat owner for this item is to be expected. Crew bonuses and indirect expenses are actually greater than those given in the preceding table.

(B) Crew bonuses $289.86.
(B) Indirect expenses $1,343.03.

If we summarize the expenditures in the boat owner's account and compare them with the boat owner's receipts (share), we get the following:

Item	(A)	(B)
Boat owner's income	$4,629.93	$ 3,728.28
Boat owner's expenditures	10,987.82	14,773.40
Difference	6,357.89 loss	11,045.12 loss

In other words, even if the boat owner's expenditures are made at ceiling prices (A), he will lose in the space of a year a sum of over $6,000, and under actual conditions, when only a part of the materials can be obtained at ceiling prices (B), he will lose around $11,000.

Crew's Account (Income and Outgo)

The crew receives as its share 40 percent of what remains from the value of the landings after the trip expenses have been subtracted. One man's share, figuring on the basis of an average crew of 28.3 men, to which must be added six men's shares to cover extra allowances to some crew members, giving a total of 34.3 men, is as follows:

One man's annual receipts	(A)	$90.00	(B)	$72.46
One man's monthly receipts	(A)	7.50	(B)	6.04

The following table shows the expenditures which the crew member must make from these receipts:

Table 6.--Itemized expenditures of crew members

Item	Amount
Working clothes (two suits plus two pairs of pants)	$ 2.69*
Gloves (48 pairs)	3.11*
Slickers (3)	6.09*
Underwear (3 suits)	.70*
Wash cloths (12)	1.00*
Boots (3 pairs)	1.25*
Slippers (6 pairs)	1.00
Luxuries (tobacco and wine)	35.30
Toilet articles (paper, etc.)	9.28
Insurance (for 10,000 yen, or $27.78)	62.84

(Translator's note.--Apparently the figure for insurance represents the premium for the whole crew, the other figures being expenditures of individual crew members. Figures marked with an asterisk represent ceiling prices.)

Tobacco is figured at the rate of 10 cigarettes per man per day, one-third of which can be got on the ration while the rest are bought on the free market, giving a yearly total of $31.42. The wine expense is figured on the basis of 5 sho 8 go (2.3 gallons) per man per year, amounting to $4.03. Toilet articles and other personal expenses such as soap, paper, public bath and barber shop fees, movie tickets, and miscellaneous expenditures amount to 83 cents a trip. The necessary amounts of working clothes, gloves, slickers, underwear, towels, and boots can by no means be obtained at the legal ceiling prices and about two-thirds are obtained on the free market, giving an actual total expenditure in case (B) of $104.72. If all of these items are bought at free market prices (C), the total will be $120.15. This

the average monthly expenditures of a crew member on bases (A), (B), and (C) are as follows:

	(A)	(B)	(C)
Monthly expenditures	$5.17	$8.73	$10.03
Taxes	.62	.28	.28
Total expenditures	5.79	9.00	10.31

If this is compared with one month's income (share), the result is as follows:

	(A)	(B)	(C)
One month's income	$7.50	$6.04	$ 6.04
One month's expenditures	5.79	9.00	10.39
Difference	1.71	2.97 loss	4.28 loss

If the articles necessary for work are all obtained on ration at the legal ceiling prices, the fisherman's net earnings are $1.71 per month, but in the actual present circumstances, in which a part or all of the items must be bought on the free market, the fisherman suffers a loss of $2.97 to $4.28 per month. Under the present ceiling prices on fish and the present supply situation for materials, the boat owner loses over $900 per month and the individual fisherman loses over $4 per month. Is it possible that the tuna fishery can expand and re-establish itself under these conditions? Can the present conditions be continued indefinitely? It is impossible for boat owners and fishermen who lose money everytime they go to sea to have any very high productive ambitions. We must conclude then that the present tuna prices do not afford values suitable for the operation of the tuna fishery.

Method of Calculating Proper Prices

The foregoing concludes the accounting of income and expenditures in the tuna longline fishery. Various factors enter into the determination of a proper price for tuna, but at least one major factor is thoroughly clear--that the price must be at least such as to make operating possible. This being the case, let us take a look at the results of the calculation of income and expenditures.

Table 7.--Income and expenditure in the tuna fishery

Item	(A)	(B)
Value of landings	$15,113.68	$15,113.68
Trip expenses	7,397.12	8,899.68
Vessel owner's income	4,629.94	3,728.28
Vessel owner's expenditures	10,987.83	14,773.40
Vessel owner's profit or loss	6,357.89 loss	11,045.12 loss

	(A)	(B)	(C)
Crew's income	$7.50	$6.04	$6.04
Crew's expenditures	5.79	9.00	10.39
Crew's profit or loss	1.71	2.96 loss	4.28 loss

In calculating prices adequate to maintain a tuna-fishing enterprise, it should be necessary to make up the losses of the boat owner and the crew and to add a fair amount of profit. For example:

Item	(A)	(B)
Boat owner's loss	$ 6,357.89	$11,045.12
Crew's loss	---	1,008.61
Crew's guaranteed income	3,301.67	3,301.67
Value of landings	15,113.68	15,113.68
Total	24,194.09	30,467.95
Company's profit	2,419.21	3,046.79
Grand total	26,611.36	33,514.74

(Translator's note.--The subtotal and grand total in column (A) are incorrect in the original table, being 209,193 yen short.)

The foregoing table is made up on the basis of a guaranteed income to the crew of $9.72 per man per month and a profit to the company of 10 percent of the total cost (without taking into account the income tax). In case all purchases of materials are made on the free market (C), the crew's loss will be $1,452.73, and in this case the grand total should be $34,004.53.

If the total receipts necessary to cover operating expenses are figured as in the foregoing, then it is possible by calculating backward to arrive at a fair price for tuna.

Table 8.--Calculated fair prices for fish

	(A)	(B)	(C)
Total operating expenses	$26,611.36	$33,514.74	$34,004.52
Total price of tuna	24,057.19*	30,163.26	30,604.07
Price (cents per pound) for tuna	.10	.11	.11
Total price of sharks and other species	2,772.25	3,351.48	3,400.45
Price (cents per pound) for sharks and other species	.018	.023	.023

*(Translator's note.--error of ¥38,507 ($106.96) in original table.)

As was shown in table 1, of the total value of the catch of a tuna long-line boat, the tuna and spearfish represent 90 percent and the sharks and other species represent 10 percent. Therefore, the operating expenses have been similarly divided 90-10 in order to compute suitable prices. Taking as the average catch per trip 44,724 pounds of tunas and 24,363 pounds of shark and other species, and figuring six trips per year, the prices per pound were calculated on the basis of the splitting of the corrected costs between tuna and sharks and other species as explained in the foregoing.

I have in this manner found the prices adequate to insure continued operation of the tuna longline fishery. The following table compares these calculated prices with the ceiling prices actually in effect at present.

Table 9.--Ceiling prices in effect on fish
[Converted to cents per pound]

Species	Region D		Region B	
Yellowfin, striped marlin, bigeyed tuna, and white marlin	$.056		$.048	
Albacore and skipjack	.051		.044	
Sailfish	.039		.034	
Broadbill swordfish	.046		.039	
Calculated fair price for tuna and spearfish	(A) $.10	(B) $.11,	(C) $.11	
Dolphin	.022		.017	
Wahoo and snake mackerel	.025		.021	
Blue shark	.016		.011	
Other sharks	.009		.006	
Calculated fair price for sharks and other species	(A) $.018,	(B) $.023,	(C) $.023	

Comparing these prices, we see that the calculated fair prices are about 1½ to 2 times the present ceiling prices.

The foregoing is a calculation of the cost price in the tuna fishery. The investigation was based on data from vessels entering ports in great consuming areas during the peak of the tuna season. Since the time of the investigation, prices have continued to rise daily. However, the price structure has not been corrected, and consequently the gap between cost and prices which existed at that time has continued to the present. (The author is an official of the Federation of Japanese Deep Sea Tuna Fishermen's Associations).

* * *

OUTLINE OF COST PRICE CALCULATION--OPERATING IN THE RED AS SHOWN BY FIGURES

Translator's note: The article from which the following data have been abstracted was apparently based on the same study as the preceding paper, but some of the cost figures were brought up to date to keep up with rising prices of materials.

These figures are for a 135-ton 250-horsepower Diesel-powered steel vessel fishing 350 baskets of long line, and represent an average of 14 boats which entered the ports of Tokyo, Yokohama, and Misaki early in 1948. Costs are figured on the basis of legal ceiling prices as of June 1948.

Crew	28.3 men
Number of trips per year	6
Landings per trip	69,088 pounds valued at $2,519
Landings for one year	414,525 pounds valued at $15,114
Total trip expenses for one year	$7,823 (includes market charges, fuel, ice, bait, etc.)
Boat owner's share of remainder	$4,374
Crew's share of remainder	$2,916
Owner's total expenses	$16,678 (includes repairs, fishing gear, taxes, interest, etc.)
Owner's yearly loss	$12,293
Crew members' individual income and expenditures (figured on the basis of 34.3 men because of extra shares):	
Yearly income	$85.02
Average monthly income	7.08
Monthly expenditures	9.21 (clothes, daily necessities, etc.)
Monthly loss per crew member	2.12

Fair prices calculated from the costs so as to allow a margin of profit:

Large tuna and marlin	$.12 per pound
Skipjack	$.07 per pound
Sharks	$.02 per pound

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DEVELOPMENT OF THE MOVEMENT TO REVISE CEILING PRICES

Translator's note: The article from which the following data were abstracted apparently represents a later revision of the study on which the two preceding articles were based. It probably is calculated on the basis of prices for materials current in October 1948.

For a vessel with a crew of 28.3 men fishing 350 baskets of long lines and making six trips a year, each trip of 37.5 days duration:

Value of one year's landings	$22,570.37
Boat owner's annual loss	13,874.57
Individual crew member's monthly income	20.43
Crew's combined annual loss	4,811.94
Total annual loss of crew and owner	18,686.51
Calculated minimum fair price for tunas and spearfishes	.15 per pound

Details of expenditures

Personnel costs	$4,245.00
Amortization of vessel costs	3,214.29
Repairs	5,870.92
Vessel equipment	3,507.96
Fuel, et cetera	5,520.96
Ice	1,442.50
Bait	4,104.17
Provisions	1,427.69
Miscellaneous expenses	1,472 24
Promotional expenses	300.44
Taxes	932 88
Business expenses	3,054 65
Insurance	1,283.51
Interest	2,849.08
Daily necessities of crew	2,543.15
Profit	3,116.33
Total	$44,886.54

The foregoing figures are based on a guaranteed monthly income for each crew member of $20.43 and a profit of $3,116.33 for the boat owner. If the year's landings of 414,526 pounds is sold for this amount, the minimum fair prices will be $.15 per pound ($1.20 per kan) for tunas and spearfishes and $.04 per pound ($.32 per kan) for sharks.

Indices of increases in prices of tuna and materials

	December 1946	June 1947	December 1947	October 1948
Fuel and lube oil	100	167	630	1,179
Cotton thread	100	126	491	915
Ice	100	213	379	837
Bait	100	164	330	676
Tuna (and spearfishes)	100	158	280	655

WHAT IS THE EFFECT OF THE INCREASE IN THE HANDLING CHARGES AND THE COST OF MATERIALS?

What has been the effect on the tuna business of the increase in the price of materials? Market handling charges were forced up in December of last year, and the ceiling price of fuel oil has also risen. And now cotton line too -- with production materials steadily going up in this fashion, the producers simply cannot get along. It is said that there is no prospect of any effective measures being taken because the persons in positions of leadership are not able to understand the real situation with regard to the effects which these increases in the price of materials have on the operation of our business.

We must realize that the increases in the price of materials are having the following effect on our operations, and we must take measures against them.

Tuna Longline Fishery

Fishing vessel of 135 tons, 250 H.P., making 6 trips per year
Number of crew--22.3 men
Gear--350 baskets
Catch--99,240 pounds per trip valued at $11,111.11
(peak season price)

Costs for one trip

Item	Increase due to price rise	Cost	Percentage of total operating costs	Remarks
Market handling charges (1% rise)	$111.11	$ 666.66	14.9	Raised in December
Staple food (ceiling price raised)	42.13	252.75	5.7	Raised in January
Oil (fuel oil up 16%)	155.48	1,065.77	23.8	Raised in December
Cotton line (up 29%. Prorated for 1 cruise)	188 61	758.81	17.0	Rise published in December
Bait	none	812.50	18.2	
Ice	none	250.13	5.6	
Provisions	none	194.44	4.4	
Miscellaneous exp.	none	468.75	10.5	
Total	$497.33	$4,469.83	100.0	

The foregoing are the expenses for one trip. We will go in more detail into the four major items making up the following percentages of the total cost: Oil 23.8 percent, bait 18.2 percent, cotton line 17.0 percent, and handling charges 14.9 percent. Of these items, the rise in the prices of oil, cotton line, and handling charges in December of last year added $455.20 to the cost per trip or $2,731.22 per year for six trips. This is broken down as follows: Oil $932.88, cotton line $1,131.66, handling charges $666.66. Since these four items make up 73.9 percent of total expenses, their cost must be brought down in any attempt to cut down operating costs. When the price rises are compared with the former prices, in the case of oil, if a tariff of 10 percent is levied, there will be an increase of $106.58 for a total of $1,172.36 which is 25.6 percent of the total amount. (Opposition is being mustered against a plan which would levy a tariff of 10 percent on oil.) /Translator's note.--This tariff did not go through./ If the market handling charge were the former 5 percent, it would reduce the amount by $111.11 or $555.55 for the year, which would be 12.7 percent of the total. Cotton line at the old price would reduce the amount by $188.61 or $570.20 for the year, making 13.3 percent of the total amount.

Adding to these increases in the cost of materials the rise in the price of rice, we see that a tuna long-line vessel actually has annual operating costs of $4,722.22.

Skipjack Pole-and-Line Fishery

Vessel of 88 tons and 176 H.P. making 12 trips per year
Crew--50 men
Catch--34,237.8 pounds per trip for a value of $2,760.00

Expenses for one trip

Item	Increase due to price rise	Cost	Percentage of total cost
Market handling charges (up 1%)	$27.60	$ 165.60	12.8
Staple food (ceiling price raised)	21.69	123.30	9.6
Oil (fuel oil up 16%)	20.55	255.21	19.8
Bait	none	375.00	29.1
Ice	none	76.11	5.9
Provisions	none	93.33	7.3
Miscellaneous expenses	none	151.39	11.8
Fishing gear expenses	none	46.43	3.6
Total	$69.84	$1,286.54	100.0

Among these items the yearly increase for fuel oil amounts to $246.60, for handling charges to $331.20, and for staple food to $260.30.

Skipjack boats usually make two long-lining trips during the winter. In this case there is an increase in expenses of about $694.44 for the two trips, making a total increase for the year of $1,532.54.

The above are the expenses for one trip. If we break these down as we did in the case of the long-line fishery, we find the following major items: Bait 29.1 percent, oil 19.8 percent, handling charges 12.8 percent; and staple food 9.6 percent of the total expenses. Of

these items, the price of oil and the handling charges rose in December, making an increase of $69.84 per trip, a total increase for the 12 trips per year of $838.10.

Thus an increase of 10 percent or even of 1 percent in the cost of one type of material means a great increase in operating expenses. This is why we oppose the rise in the price of oil, why we have been unable to consent to the 1-percent increase in market handling charges, and why we have requested a reconsideration of the raise in the price of cotton line. We must use our cooperative power to devise methods by which we can obtain materials cheaply.

By successfully keeping the proposed raise in the market handling charges of 7 percent down to 6 percent, and by stopping the rise in the price of oil, which in the original plan was to have been 26 percent, at 16 percent, we have effected a saving per vessel per year of about $8,861.11 in the case of a 135-ton tuna longline vessel and $472.22 in the case of an 88-ton skipjack and tuna boat. We must thoroughly realize how important our organized movement is and strive in the future to strenghten our organization even more.

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